

CLAIMS

[1] A combustion gas extraction probe for extracting a high-temperature combustion gas while cooling said high-temperature combustion gas with a low-temperature gas characterized by making said low-temperature gas flow in a direction that is substantially perpendicular to a sucking direction of the high-temperature combustion gas and is toward a center of a flow of said high-temperature combustion gas such that said low-temperature gas reaches a central portion of said high-temperature combustion gas for mixed cooling.

[2] The combustion gas extraction probe as claimed in claim 1 comprising:

- an inner tube in which the high-temperature combustion gas flows;
- an outer tube surrounding said inner tube;
- a low-temperature gas discharge hole provided in said inner tube; and
- a low-temperature gas supply means for supplying the low-temperature gas between the inner tube and the outer tube, and discharging the low-temperature gas from the discharge hole into the direction that is substantially perpendicular to the sucking direction of the high-temperature combustion gas and is toward the center of the flow of said high-temperature combustion gas.

[3] The combustion gas extraction probe as claimed in claim 1 comprising:

- an inner tube in which the high-temperature combustion gas flows;
- an outer tube surrounding said inner tube and having a folded portion to cover a head of the inner tube;
- a low-temperature gas discharge hole provided at a portion of said folded portion, said portion of the folded portion facing the high-temperature combustion gas; and
- a low-temperature gas supply means for supplying the low-temperature gas

between the inner tube and the outer tube, and discharging the low-temperature gas from the discharge hole into the direction that is substantially perpendicular to the sucking direction of the high-temperature combustion gas and is toward the center of the flow of said high-temperature combustion gas.

[4] The combustion gas extraction probe as claimed in claim 2 or 3, wherein plurality of said low-temperature gas discharge holes are provided, and individual discharge holes are rotationally symmetrically arranged at substantially the same positions from a head of the probe in the high-temperature combustion gas sucking direction.

[5] The combustion gas extraction probe as claimed in claim 2 or 3, wherein plurality of said low-temperature gas discharge holes are arranged in stages in the high-temperature combustion gas sucking direction.

[6] The combustion gas extraction probe as claimed in one of claims 1 to 5, wherein flow speeds of the low-temperature gas and the high-temperature combustion gas are preferably not less than 40 m/s and not more than 100 m/s.

[7] The combustion gas extraction probe as claimed in one of claims 1 to 6, characterized by having a blaster injecting compressed air in an opposite direction to the sucking direction of said the high-temperature combustion gas at the head of the probe.

[8] A combustion gas treatment method using said combustion gas extraction probe claimed in one of claims 1 to 7 characterized in that regardless of amount of the high-temperature combustion gas extracted, amount of the low-temperature gas discharged is substantially uniformly maintained, and cooling gas is mixed again between an exit of said probe and an extracted gas disposal equipment in a rear stage of said probe to adjust said combustion gas to a predetermined temperature.

STATEMENT REFERRED TO IN ARTICLE 19

In Claim 1 of CLAIMS, it is clarified that a low-temperature gas is flown into a high-temperature combustion gas in a direction that is substantially perpendicular to a sucking direction of the high-temperature combustion gas and is toward a center of a flow of the high-temperature combustion gas such that the low-temperature gas reaches a central portion of the high-temperature combustion gas for mixed cooling

In the paragraph number [0015] of the first cited document (JP09-301751), it is described “the direction that the cooling air flows out of the outlet 8B is perpendicular to the direction that the extracted gas flows in the extraction pipe 1 and tangential to the inner diameter of the pipe 1”, and Fig. 3 shows a condition that the cooling air is introduced in a direction perpendicular to the flow of the extracted gas. Even if the cooling air is introduced as stated above, since it is stated in the same paragraph “the cooling air becomes a swirl flow in the extraction pipe 1, which protects the inner wall of the extraction pipe 1 from the exhaust gas and simultaneously cools the extracted gas”, the cooling air is not introduced such that the low-temperature gas reaches a central portion of the high-temperature combustion gas.